Trend Study 10R-32-02

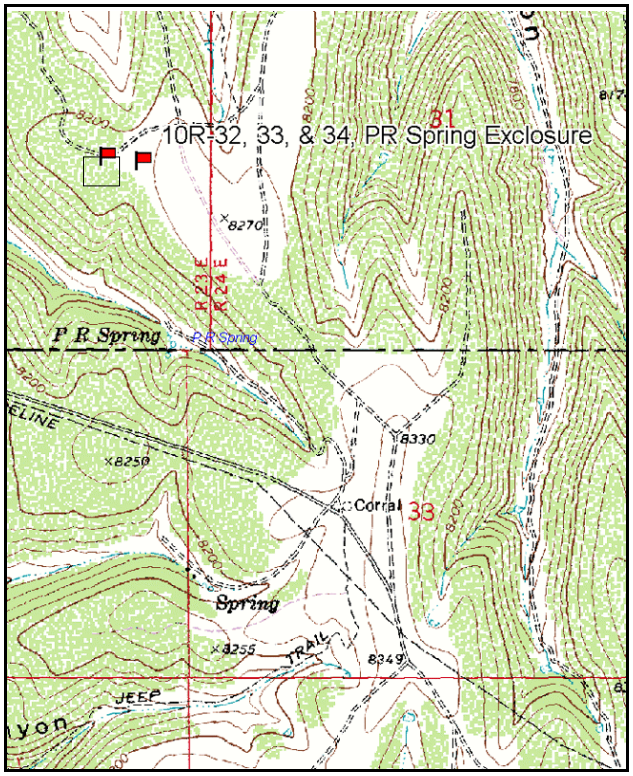
Study site name: PR Spring Total Exclosure . Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 260 degrees magnetic.

Frequency belt placement: line 1 (34, 59, & 95ft), line 2 (11, & 71ft).

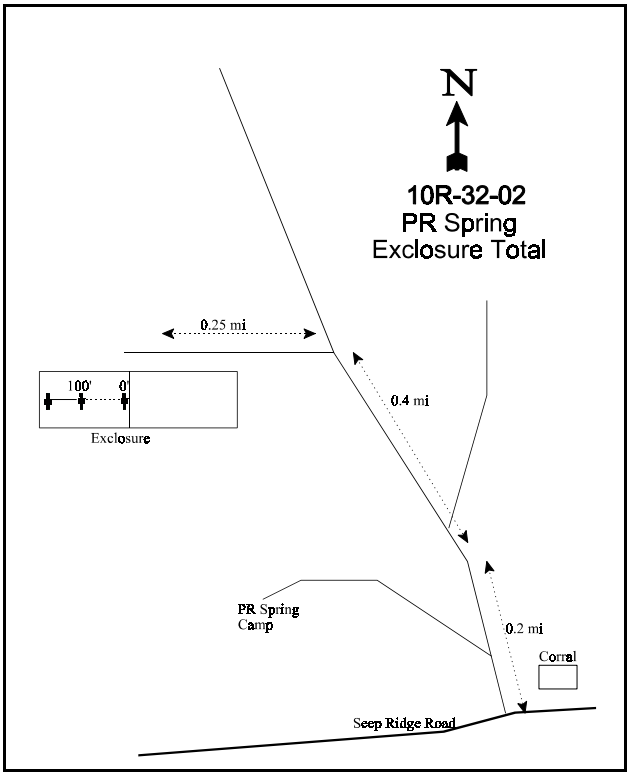
LOCATION DESCRIPTION

On Seep Ridge Road go to the PR Spring turnoff. Travel 0.2 miles staying right (do not go down road to PR Spring and campground). Continue left 0.4 miles. Turn left once again and travel approximately 0.25 miles to a weather station then the exclosure. The 0-foot stake in the total exclosure is located near the fence separating the total and livestock exclosures. The 0-foot stake is five fence posts from the north fence. The first baseline is 100 feet long and the second baseline is 86 feet long. The 0-foot stake is marked by browse tag number 435.



Map Name: P R Spring

Township 15S , Range 23E, Section 36



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4369908 N 647433 E

DISCUSSION

PR Spring Total Exclosure - Study No. 10R-32

This study was established in 2002 to gather baseline data for a 3-way exclosure that was built in 2001 by the BLM near PR Spring on the North Book Cliffs. This transect samples a mountain brush community within the total exclosure which is now inaccessible to all classes of animals. The study lies on a nearly level ridge at an elevation of 8,200 feet. Due to the dimensions of the exclosure, the sampling baseline is only 200 feet in length. The area represents summer range for wildlife, and is also grazed by livestock. In 2002, a pellet group transect was read to estimate use before the exclosure was constructed. Elk, deer, and cattle use was estimated at respectively 23, 39, and 7 days use/acre (56 edu/ha, 96 ddu/ha, and 18 cdu/ha). All wildlife pellet groups were from the late winter and spring of 2001, while cattle pats were from previous grazing season.

Soils on the site are clay loam in texture and neutral in reactivity (pH of 6.7). Percent organic matter is moderate at 3.6%. Soils are quite shallow with an effective rooting depth of less than 10 inches. Penetrometer readings taken in 2002 also show that the upper 8 inches of the profile are very rocky. Erosion is minimal due to the abundance of vegetation and litter cover and lack of significant slope. The erosion condition class was determined as stable in 2002.

The browse component dominates the vegetation community as it provides 75% of the total cover on the site. Total line-intercept canopy cover of the browse component was estimated at 61% in 2002. Several preferred species are present including serviceberry, mountain big sagebrush, true mountain mahogany, and bitterbrush. Snowberry, although less preferred, provides the highest average cover and has the highest density of any single species in the total exclosure. Snowberry density was estimated at 5,320 plant/acre with most of the population being mature plants. Use on snowberry prior to the exclosure was light. Population densities of serviceberry, mountain big sagebrush, and true mountain mahogany were estimated at 1,800 plants/acre, 3,560 plants/acre, and 2,980 plants/acre in 2002. Prior to the exclosure, use on serviceberry and mahogany was moderate to heavy, while use on mountain big sagebrush was light. Decadence for all of these species was low, and vigor was good in 2002. Recruitment was very good for all of the preferred species. Annual leader growth for serviceberry, mountain big sagebrush, and true mountain mahogany averaged respectively 2.1 inches, 3.1 inches, and 1.9 inches in 2002. Less preferred browse that were also sampled include stickyleaf low rabbitbrush, Gambel oak, and grey horsebrush.

The understory is rather sparse for a mountain brush community at this elevation. This is due in part to the dense canopy of shrubs as well as drought conditions in 2002. Grasses are comprised totally of perennial species including a *Carex*, thickspike wheatgrass, mutton bluegrass, Kentucky bluegrass, prairie junegrass, and bluebunch wheatgrass. Most of the grasses are found underneath, or in close proximity to shrubs, and it was noted that interspaces were relatively bare in 2002. The forb component is moderately diverse, but had only fair production. Two species, an *astragalus* and mat penstemon, provided the majority of the forb cover. Composition is fairly good with desirable species such as pale agoseris, yellow Indian paintbrush, redroot eriogonum, sulfur eriogonum, and Lewis flax being present. The understory would greatly benefit from a reduction in overstory shrub cover and density.

APPARENT TREND ASSESSMENT

Soils appear to be stable with an abundance of protective ground cover from vegetation and litter. Erosion is very minimal at the present time and will likely remain so. The browse component is diverse and abundant and appears to be stable. Preferred species are plentiful and have very good reproduction. Line-intercept canopy cover for browse is estimated at over 61% which is very high. The herbaceous understory has fair diversity and a fairly good composition, but could be much more abundant with a reduction in the overstory canopy of shrubs. With only one year of data, it is difficult to tell which direction the understory trend, but further increases in browse would most likely be negative for herbaceous species.

HERBACEOUS TRENDS --
Herd unit 10R, Study no: 32

Type	Species	Nested Frequency '02	Quadrat Frequency '02	Average Cover % '02
G	Agropyron dasystachyum	193	70	3.82
G	Agropyron spicatum	5	3	.06
G	Carex spp.	148	46	5.37
G	Koeleria cristata	6	2	.18
G	Poa fendleriana	74	24	2.85
G	Poa pratensis	16	6	.25
Total for Annual Grasses		0	0	0
Total for Perennial Grasses		442	151	12.55
Total for Grasses		442	151	12.55
F	Agoseris glauca	4	2	.01
F	Antennaria rosea	4	2	.01
F	Arenaria spp.	5	2	.03
F	Astragalus spp.	91	40	2.77
F	Astragalus utahensis	6	2	.15
F	Balsamorhiza sagittata	1	1	.00
F	Castilleja flava	31	11	.49
F	Cirsium spp.	19	10	.15
F	Collinsia parviflora (a)	2	1	.00
F	Crepis acuminata	5	1	.03
F	Erigeron eatonii	75	33	.54
F	Eriogonum racemosum	18	7	.13
F	Eriogonum umbellatum	20	11	.37
F	Ipomopsis aggregata	4	2	.03
F	Lepidium spp. (a)	3	2	.01
F	Linum lewisii	11	6	.08
F	Machaeranthera canescens	4	2	.03
F	Penstemon caespitosus	129	53	1.56
F	Phlox longifolia	7	5	.02
F	Taraxacum officinale	14	6	.03
F	Tragopogon dubius	4	2	.01
Total for Annual Forbs		5	3	0.01
Total for Perennial Forbs		452	198	6.51
Total for Forbs		457	201	6.52

BROWSE TRENDS --
Herd unit 10R, Study no: 32

Type	Species	Strip Frequency '02	Average Cover % '02
B	Amelanchier utahensis	55	11.43
B	Artemisia tridentata vaseyana	77	14.28
B	Cercocarpus montanus	66	7.50
B	Chrysothamnus viscidiflorus viscidiflorus	60	3.65
B	Purshia tridentata	11	.33
B	Quercus gambelii	20	.95
B	Symphoricarpos oreophilus	93	17.60
B	Tetradymia canescens	3	.04
Total for Browse		385	55.81

CANOPY COVER --
Herd unit 10R, Study no: 32

Species	Percent Cover '02
Amelanchier utahensis	13.58
Artemisia tridentata vaseyana	20.08
Cercocarpus montanus	5.33
Chrysothamnus viscidiflorus viscidiflorus	1.00
Gutierrezia sarothrae	.92
Purshia tridentata	.17
Quercus gambelii	.25
Symphoricarpos oreophilus	20.33

Key Browse Annual Leader Growth
Herd unit 10R , Study no: 32

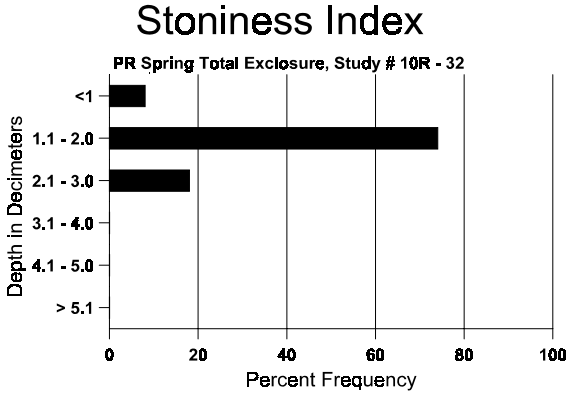
Species	Average leader growth (in) '02
Artemisia tridentata vaseyana	3.1
Amelanchier utahensis	2.1
Cercocarpus montanus montanus	1.9

BASIC COVER --
Herd unit 10R, Study no: 32

Cover Type	Nested Frequency '02	Average Cover % '02
Vegetation	416	58.40
Rock	40	.23
Pavement	182	7.22
Litter	481	58.92
Cryptogams	17	.25
Bare Ground	182	9.25

SOIL ANALYSIS DATA --
Herd Unit 10R, Study no: 32, PR Spring Total Exclosure

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.74	-	6.8	35.3	32.7	32.0	3.6	14.9	291.2	0.8



PELLET GROUP FREQUENCY --
Herd unit 10R, Study no: 32

Type	Quadrat Frequency '02
Rabbit	12
Elk	9
Deer	15
Cattle	1

Pellet Groups per Acre '02	Days Use per Acre (ha) '02
-	-
296	23 (56)
505	39 (96)
87	7 (18)

Pellet count for pre-exclosure use.

BROWSE CHARACTERISTICS --
Herd unit 10R, Study no: 32

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	02	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
Y	02	17	1	1	13	3	-	3	-	-	38	-	-	-	760			38
M	02	9	5	6	3	5	10	6	-	-	44	-	-	-	880	52	51	44
D	02	1	-	2	-	-	4	-	-	1	4	-	-	4	160			8
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing '02		Moderate Use 16%				Heavy Use 27%				Poor Vigor 04%					%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'02		1800	Dec:		9%
Artemisia tridentata vaseyana																		
S	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	02	38	-	-	-	-	-	-	-	-	38	-	-	-	760			38
M	02	91	13	7	3	-	-	-	-	-	111	2	1	-	2280	30	38	114
D	02	19	5	1	1	-	-	-	-	-	19	-	-	7	520			26
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	340			17
% Plants Showing '02		Moderate Use 10%				Heavy Use 04%				Poor Vigor 04%					%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'02		3560	Dec:		15%
Cercocarpus montanus																		
S	02	-	-	-	1	-	-	3	-	-	4	-	-	-	80			4
Y	02	20	2	3	13	-	-	-	-	-	38	-	-	-	760			38
M	02	7	4	35	5	15	35	4	-	-	103	2	-	-	2100	43	35	105
D	02	-	-	1	-	-	1	-	-	-	1	-	-	1	40			2
X	02	-	-	1	-	-	-	-	-	-	1	-	-	-	80			4
% Plants Showing '02		Moderate Use 14%				Heavy Use 52%				Poor Vigor .68%					%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'02		2900	Dec:		1%
Chrysothamnus viscidiflorus viscidiflorus																		
S	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	02	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
M	02	114	-	-	18	-	-	2	-	-	134	-	-	-	2680	13	14	134
D	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
% Plants Showing '02		Moderate Use 00%				Heavy Use 00%				Poor Vigor 00%					%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'02		2980	Dec:		1%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
M	02	1	3	1	-	1	4	2	-	-	10	2	-	-	240	12	18	12
D	02	-	-	-	-	-	1	-	-	-	1	-	-	-	20			1
% Plants Showing '02		Moderate Use 31%				Heavy Use 46%					Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'02		260	Dec:		8%
Quercus gambelii																		
S	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	02	3	-	-	6	-	-	5	-	-	14	-	-	-	280			14
M	02	11	1	-	2	-	-	-	-	-	14	-	-	-	280	-	-	14
% Plants Showing '02		Moderate Use 04%				Heavy Use 00%					Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'02		560	Dec:		-
Symphoricarpos oreophilus																		
S	02	5	-	-	1	-	-	1	-	-	7	-	-	-	140			7
Y	02	43	-	-	6	-	-	-	-	-	49	-	-	-	980			49
M	02	147	-	-	62	-	-	8	-	-	217	-	-	-	4340	17	31	217
% Plants Showing '02		Moderate Use 00%				Heavy Use 00%					Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'02		5320	Dec:		-
Tetradymia canescens																		
Y	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	02	3	-	-	-	-	-	-	-	-	3	-	-	-	60	7	8	3
% Plants Showing '02		Moderate Use 00%				Heavy Use 00%					Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'02		100	Dec:		-

PR Spring Exclosure Complex - Summary

Because the exclosure complex was built only the year prior to the establishment of these transects, treatment effects cannot be determined from the data at the present time. However, the data does provide a baseline for the vegetation community sampled by these studies. Future readings will allow monitoring of changes and comparisons between the treatments to be evaluated.

It is important to point out that the exclosure complex was not built in a totally homogeneous area. The total and livestock exclosures were placed in an area where several browse species are moderately abundant. This includes large, tree-like serviceberry plants that provide an abundance of overhead canopy cover. The transect that monitors the community outside of the exclosures is much more open where mountain big sagebrush is the dominant species. Due to the dimensions of the exclosure, the transects established inside the total and livestock exclosures are only 200 feet in length, while the transect outside is 500 feet long. Some of the difference in vegetation characteristics between these studies arises from differing transect lengths as well as the heterogeneity of the vegetation community.

Basic ground cover characteristics are similar between all of the transects. Vegetation and litter cover are abundant, especially the browse component. Bare ground ranges from 16% inside the livestock exclosure to only 7% within the total exclosure. Rock and pavement are low on all the treatments.

The browse component dominates the vegetation community on all transects. Inside the total exclosure, browse accounts for 74% of the total vegetation cover. Shrubs provide about 60% of the vegetation cover both inside the livestock exclosure and outside the exclosure complex. Herbaceous species, especially forbs, are somewhat limited on these studies. Grasses provide respectively 28%, 24%, and 11% of the vegetation cover in the total exclosure, livestock exclosure, and outside the exclosure complex. Forbs provide 16% or less of the total cover on all sites.